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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/662,302	09/16/2003	Ennis T. Ogawa	TI-33455.1	1776
23494	7590	02/09/2005	EXAMINER	
TEXAS INSTRUMENTS INCORPORATED P O BOX 655474, M/S 3999 DALLAS, TX 75265			STEVENSON, ANDRE C	
			ART UNIT	PAPER NUMBER
			2812	

DATE MAILED: 02/09/2005.

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/662,302

Applicant(s)

OGAWA ET AL.

Examiner

Andre' C. Stevenson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 15-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 15-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

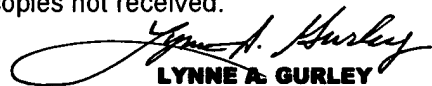
Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on September 16, 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.


LYNNE A. GURLEY

PRIMARY PATENT EXAMINER**TC 2800, AU 2812****Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 09/16/03.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Detailed Action

Objection to Drawings

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description:

- 1) **Figure #1;** Item 106 cannot be found in the figure. Also, it cannot be easily seen what area item 108 is directed to.
- 2) **Figure #3;** Item reference markings for 304, 310 and 312 should be placed outside the actual drawing area to make them easily readable. Also, the line indicating the “interconnect width” should be a straight line. Finally, the area that item reference marking 302 refers to cannot be readily seen.
- 3) **Figure #4;** Items 406 and 408, referenced in the specifications, cannot be found in the drawing. Also, it cannot be seen what area item 402 is directed to.
- 4) **Figure #5;** It cannot be readily seen what area item 502 is referring to. Also, item reference markings 508, 510 and 512 should be placed outside the drawing area for the purpose of making them easier to see.

Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being

amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 15-20 are rejected under 35 U.S.C. 102(e) as being anticipated by Yang et al.

(U.S. Pat. No. 6,468,894, Patented 10/22/02, Filed 03/21/01).

Yang shows, in figures 1-12 and corresponding text, in a method where damascene interconnects, both electrically active and inactive, are formed, with respect to **claim #15**, a semiconductor device structure comprising: a first metallic interconnect (**fig. 7, item 14 & fig 12, item 56**); a second metallic interconnect (**fig. 7, item 28 & fig. 12, item 64**) (**column 3, lines 45-67; column 4, lines 1-5; column 5, lines 18-30**); a primary via structure (**any one of item 30 in fig 7, or any one of item 70 in fig 12**), disposed between and electrically intercoupling the first and second metallic interconnects (**column 5, lines 31-40**); and a buffer structure (**fig. 7, item 32, 34 and 36, or any one of item 30 remaining from the primary via structure, or fig**

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12, item 68, 72 and 74, or any one of item 70 remaining from the primary via structure), disposed upon the first metallic interconnect in proximity to the primary via structure, and adapted to buffer the primary via structure from diffusive voiding occurring at a contact point between the primary via structure and the first metallic interconnect (**column 5, lines 31-40; column 4, lines 30-50**). Note that the Examiner considers it inherent, that for example, items 32, 34, 36 and any one of 30, apart from the primary via structure, would buffer the primary structure from diffusive voiding in that the vias 32, 34 and 36 are “capable” of remedying the conventional prior art problem of diffusive voiding by providing alternatives to the primary via structure regarding diffusion issues. *Pertaining to Claim #16*, Yang also shows that the second metallic interconnect and the primary via structure are copper-based dual damascene structures. (**Fig. 8-12 item 62, 64 and 66; column 1, lines 47-52; column 6, lines 22-33**). *Pertaining to claim #17*, Yang shows, wherein the buffer structure comprises a second via structure, disposed between and electrically intercoupling the first and second interconnects. (**Fig. 12, item 72, 74 and any one of item 70 remaining from the primary via structure; Fig 7, any one of item 30 remaining from the primary via structure; column 6, lines 22-33**). *Pertaining to claim 18*, Yang shows, wherein the buffer structure comprises a second, electrically inactive, via structure (**item 36**), disposed upon the first metallic interconnect (**item 14**) proximal to the primary via structure (**Fig. 7**). *Pertaining to claim #19*, Yang shows, wherein the buffer structure comprises of an electrically inactive structure disposed upon the first metallic interconnect to immediately and completely surround the primary via structure. (**Fig. 7-12, item 32, 34, 36, 68, 72; column 6, lines 22-33; column 5, lines 49-54**). Finally, *pertaining to claim #20*, Yang shows, wherein the buffer structure comprises: a second

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via structure, disposed between and electrically intercoupling the first and second metallic interconnects (**any one of item 30 remaining from the primary via structure**); and a third electrically inactive (**item 36**), via structure, disposed upon the first metallic interconnect (**item 14**) proximal to the primary via structure (**column 5, lines 32-42 and lines 49-54**).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure; Dirahoui et al. (U.S. Pat. No. 6,492,259), Chuang (U.S. Pat. No. 6,828,223), Motsiff et al. (U.S. Pat. No. 6,573,538), Hasegawa et al. (U.S. Pat. No. 6,452,274).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andre' Stevenson whose telephone number is (571) 272 1683. The examiner can normally be reached on Monday through Friday from 7:30 am to 4:30 pm.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael S. Lebentritt, can be reached on (571) 272 1873. The fax phone number for the organization where this application or proceeding is assigned is (703) 308 7724.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308 0956. Also, the proceeding numbers can be used to fax information through the Right Fax system;

(703) 872-9306

Andre' Stevenson

02/01/05


LYNNE A. GURLEY
PRIMARY PATENT EXAMINER
TC 2800, AU 2812